P02030US2A(P336)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In the application of	)	Group Art Unit 1711
	)	
JOHN B. LETTS,	)	John Cooney, Examiner
WAYNE E. LAUGHLIN, and	)	
BRUCE M. MILLER	)	Conf. No. 3593
	)	
	)	Atty Docket: P02030US2A
Serial No. 10/632,343	)	
	)	Dated: July 6, 2010
Filed August 1, 2003	)	
	)	
For INSULATION BOARDS AND METHODS FOR THEIR MANUFACTURE	)	

APPEAL BRIEF PURSUANT TO 37 C.F.R. 41.37

BOX AF
COMMISSIONER FOR PATENTS
P.O. BOX 1450
ALEXANDRIA, VA 22313-1450

Dear Sir:

This is an appeal to the Board of Patent Appeals from the final rejections in the Office Action mailed November 30, 2009. The Notice of Appeal was mailed on March 1, 2010, and received by the Office on March 3, 2010. The present appeal is of claims 1, 30-40, 42-64 and 65-69 of the subject application.

I. REAL PARTY IN INTEREST

The owner of the present patent application is Bridgestone Firestone Diversified Products LLC.

II. RELATED APPEALS AND INTERFERENCES

Appellants and Appellants' legal representatives, or their Assignee(s), are not aware of any related Appeals or Interferences that would directly affect or be directly affected by, or have a bearing on the Boards decision in the present pending Appeal.

III. STATUS OF CLAIMS

Claims 1, 30-40, 42-64 and 65-69 are pending and stand rejected under 35 U.S.C. §112, first paragraph. Claims 1, 30-31, 34-36, 46, and 51-54 are pending and stand rejected under 35 U.S.C. §102(b). Claims 1, 30-40, 42-64 and 66-69 are the subject of this appeal. Claims 2-29, 41, and 65 are cancelled.

It is noted that claims 32-33, 39-40, 42-45, 47-50, 55-64, and 66-69 are not rejected in view of the prior art.

IV. STATUS OF AMENDMENTS

The claims were last amended on August 24, 2009. There have been no amendments to the claims filed subsequent to the final rejection of the claims in the Office Action of November 30, 2009.

V. SUMMARY OF THE CLAIMED SUBJECT MATTER

The claimed subject matter of claim 1 relates to a method for producing polyisocyanurate foam insulation board. As set forth in claim 1, these polyisocyanurate foam insulation boards are produced by contacting a stream of reactants that comprise an isocyanate-reactive compound with a stream of reactants that include an isocyanate compound to form a reaction product (page 2, lines 18-21). The reaction takes place in a mix head (page 4, line 5) in the presence of a blowing agent (page 4, line 16) and air (page 8, lines 11-13). The blowing agent is selected from the group consisting of alkanes, (cyclo)alkanes, hydrofluorocarbons, hydrochlorofluorocarbons, fluorocarbons, fluorinated ethers, alkenes, alkynes and noble gases (page 5, lines 16-19). The air is added into either stream or both streams of reactants (page 4, lines 6-9) in an effective amount to increase the volume of developing foam as it instantaneously leaves the mix head (page 9, lines 11-30; page 10, lines 3-5) prior to the time any blowing agent that relies on the heat of reaction to expand can contribute to any foaming process (page 9, lines 16-21) under atmospheric pressure by at least 1.25 (page 10, line 8). This instantaneous foaming once the mixture leaves the mix head is known as frothing (page 9, lines 25-26).

The claimed subject matter as set forth in independent claim 34 relates to a method for producing polyisocyanurate foams. As set forth in claim 34, these foams may be produced by providing an A-side stream of reactants including an isocyanate. (page 4, lines 19-20). A B-side steam of reactants is provided including an isocyanate reactive component and a blowing agent selected from the group consisting of alkanes, (cyclo)alkanes, hydrofluorocarbons, hydrochlorofluorocarbons, fluorocarbons, fluorinated ethers, alkenes, alkynes and noble gases (page 5, lines 16-19). Nitrogen is added to the A or B side stream (page 4, lines 8-10)) in an effective amount to increase the volume of developing foam as it instantaneously leaves the mix head (page 9, lines 11-30; page 10, lines 3-5) prior to the time any blowing agent that relies on the heat of reaction to expand can contribute to any foaming process (page 9, lines 16-21) under atmospheric pressure by at least 1.25 (page 10, line 8).

The claimed subject matter as set forth in independent claim 39 is similar to claim 34 and relates to a method for making polyisocyanurate foams. As set forth in claim 39, these foams may be produced by providing an A-side stream of reactants including an isocyanate (page 4, lines 19-20). A B-side steam of reactants is provided including an isocyanate reactive component selected from the group consisting of polyols and mixtures thereof (page 5, lines 5-15) and a blowing agent selected from the group consisting of alkanes, (cyclo)alkanes, hydrofluorocarbons, hydrochlorofluorocarbons, fluorocarbons, fluorinated ethers, alkenes, alkynes and noble gasses. (page 5, lines 16-19). It is required that an excess of isocyanate to isocyanate reactive component (e.g., polyol) be employed so as to produce a polyisocyanurate foam (page 8, lines 13-18). Nitrogen is added to the A or B side stream (page 4, lines 8-10)) in an effective amount to increase the volume of developing foam as it instantaneously leaves the mix head (page 9, lines 11-30; page 10, lines 3-5) prior to the time any blowing agent that relies on the heat of reaction to expand can contribute to any foaming process (page 9, lines 16-21) under atmospheric pressure by at least 1.25 (page 10, line 8). The claim is further limiting in that the A-side and B-side streams of reactants are contacted in the mix head at a temperature of about 29 °C to about 35 °C and a pressure of about 1800 psi to 2400 psi (page 11, lines 29-31; page 12, lines 1-3).

The claimed subject matter of claim 56 relates to a method for manufacturing a polyisocyanurate foam insulation board. As set forth in claim 56, these polyisocyanurate foam insulation boards are produced by continuously contacting a stream of reactants that comprise an isocyanate-reactive compound with a stream of reactants that include an isocyanate compound in a mix head to form a reaction product (page 2, lines 18-21). The developing foam formed is then continuously deposited on a facer in a laminator (page 4, lines 4, lines 17-19; page 12, lines 2-3). An effective amount of an inert gas having a boiling point of less than 20°C (page 8, lines 1-3) is introduced into one of the streams or both of the streams of reactants (page 4, lines 6-9) to increase the volume of developing foam as it instantaneously leaves the mix head (page 9, lines 11-30; page 10, lines 3-5) prior to the

time any blowing agent that relies on the heat of reaction to expand can contribute to any foaming process (page 9, lines 16-21) under atmospheric pressure by at least 1.25 (page 10, line 8). The blowing agent is selected from the group consisting of alkanes, (cyclo)alkanes, hydrofluorocarbons, hydrochlorofluorocarbons, fluorocarbons, fluorinated ethers, alkenes, alkynes and noble gases (page 5, lines 16-19).

The claimed subject matter as set forth in independent claim 64 is similar to claim 39 and relates to a method for making polyisocyanurate foams. As set forth in claim 64, these foams may be produced by providing an A-side stream of reactants including an isocyanate to a mix head (page 4, lines 19-20). A B-side steam of reactants is provided including an isocyanate reactive component and a blowing agent selected from the group consisting of alkanes, (cyclo)alkanes, hydrofluorocarbons, hydrochlorofluorocarbons, fluorocarbons, fluorinated ethers, alkenes, alkynes and noble gasses. (page 5, lines 16-19). An inert gas is added to the A or B side stream (page 4, lines 8-10) in an effective amount to increase the volume of developing foam as it instantaneously leaves the mix head (page 9, lines 11-30; page 10, lines 3-5) prior to the time any blowing agent that relies on the heat of reaction to expand can contribute to any foaming process (page 9, lines 16-21) under atmospheric pressure by at least 1.25 (page 10, line 8). The claim is further limiting in that the A-side and B-side streams of reactants are contacted in the mix head at a temperature of about 29 °C to about 35 °C and a pressure of about 1800 psi to 2400 psi (page 11, lines 29-31; page 12, lines 1-3).

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

Claims 1, 30-40, 42-64 and 66-69 stand rejected under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement, the Examiner asserting that Applicants' originally filed supporting disclosure does not provide support for the expansion operations of the claims as they are now expressed differentiating between the various expansion agents identified by the claims.

Claims 1, 30, 31, 34-36, 46 and 51-54 stand rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 3,882,052 to Raynor et al.

Claims 34 and 51 stand rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 5,264,464 to Wishneski et al.

VII. ARGUMENT

a. Arguments to Rejections under 35 U.S.C. § 112, first paragraph

In the Final Office Action dated November 30, 2009, the Examiner has rejected claims 1, 30-40, 42-64 and 66-69 under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The Examiner asserts that the originally filed disclosure does not provide support for "the expansion operations of the claims as they are now expressed differentiating between the various expansion agents identified by the claims." (see page 2, Office Action 11/30/2010).

The Examiner's position is in error. To the extent understood, the language at issue was added into Claims 1, 30, 31, 34, 35, 36, 39, 40, 52, 56, 60, 61, and 64 in the amendment dated August 24, 2009; namely the phrase "prior to the time any blowing agent that relies on a heat of reaction to expand can contribute to any foaming process." It is respectfully noted that this language is taken verbatim from page 9, lines 19-21, of the original specification, wherein the paragraph where the language is contained was expressly differentiating between the various expansion agents identified by the claims. Consequently, Appellants believe the recited limitation is fully supported by the original disclosure.

In light of these arguments, a Decision indicating that claims 1, 30-40, 42-64 and 66-69 meet the requirements of 35 U.S.C. § 112 is earnestly solicited. As noted above, the following rejections under 35 U.S.C. § 102(b) have not been levied against claims 32-33, 39-40, 42-45, 47-50, 55-64, and 66-69 and therefore at least these claims are allowable on the record with the removal of the rejection under 35 U.S.C. § 112.

b. Arguments to Rejections under 35 U.S.C. § 102(b)

Arguments against anticipation of Claims 1, 30, 31, 34-36, 46 and 51-54 by U.S. Patent No. 3,882,052 to Raynor et al.

The Examiner has rejected claims 1, 30, 31, 34-36, 46 and 51-54 under 35 U.S.C. 102(b) as being anticipated by Raynor et al. (U.S. Patent No. 3,882,052).

The Examiner's anticipation rejection is erroneous for at least the following reasons:

i. Raynor has been misinterpreted at least as it pertains to expansion and pre-expansion of polyurethane foams; and

ii. the doctrine of inherency has been misapplied.

The claims differentiate "frothing" and "non-frothing":

> ...adding an effective amount of the air in the stream of reactants comprising the isocyanate-reactive compound, or the stream of reactants including the isocyanate compound, or both, to increase the volume of developing foam as it instantaneously leaves the mix head prior to the time any blowing agent that relies on a heat of reaction to expand can contribute to any foaming process under atmospheric pressure by at least 1.25[1].
>
> ...adding an effective amount of nitrogen to the A-side or B-side stream of reactants, to increase the volume of developing foam as it instantaneously leaves the mix head, prior to the time any blowing agent that relies on a heat of reaction to expand can contribute to any foaming process, under atmospheric pressure by at least 1.25[2].
>
> ...adding an effective amount of nitrogen to the A-side or B-side stream of reactants to increase the volume of developing foam as it instantaneously leaves the mix head under atmospheric pressure by at least 1.25, prior to the time any blowing agent that relies on a heat of reaction to expand can contribute to any foaming process;[3]...
>
> ... introducing an effective amount of an inert gas... to increase the volume of developing foam as it instantaneously and continuously leaves the mix head, prior to the time any blowing agent that relies on a heat of reaction to expand can contribute to any foaming process, under atmospheric pressure by at least 1.25[4].
>
> ...adding an effective amount of an inert gas to increase the volume of developing foam as it instantaneously leaves the mix head, prior to the time any blowing agent that relies on a heat of reaction to expand can contribute to any foaming process, under atmospheric pressure by at least 1.25[5],...

Page 9, lines 16-23 of the written description defines a frothed foam as resulting from the expansion of an inert gas within a stream of reactants that is released to atmospheric pressure from a higher pressure. This occurs instantaneously after leaving the mix head. In contradistinction, a non-frothing foam expands after a heat of reaction between the isocyanate and the isocyanate-reactive component. This delay provides for a less viscous

1 Claim 1
2 Claim 34
3 Claim 39
4 Claim 56

flow of material out of the mix head prior to foaming. A frothed foam starts foaming immediately and is therefore immediately more viscous.

Raynor emphasizes the criticality of non-frothing polyurethane foam (Col. 1, lines 64-65; Col. 3, lines 63-68). The Examiner appears to dismiss this fact and, instead, relies on:

i. Raynor's teaching of no substantial pre-expansion (Col. 5, lines 50-65), which the Examiner opines does not fully exclude some pre-expansion;

ii. Raynor's teaching (Col. 5, lines 59-61) that the foaming reaction commences practically as soon as the mixture is deposited; and

iii. Applicants have not demonstrated a difference in their invention based on amounts of gas employed over the amounts allowed for by the teachings of Raynor.

The Examiner has provided no evidence that one skilled in the art would interpret "no substantial pre-expansion" as allowing for an instantaneous or "pre-expansion" of at least 25%. In fact, when Raynor's teaching of "no substantial pre-expansion" is taken within the context of the entire reference, which reference clearly teaches the desire to produce non-frothing polyurethane, it is beyond credulity to suggest that one skilled in the art would interpret Raynor's "no substantial pre-expansion" as teaching an expansion of at least 25%. The Examiner's interpretation is simply in error.

Raynor does teach that the foaming reaction occurs "practically as soon as the mixture is deposited from the static mixer onto the surface or into a mold" (Col. 5, lines 59-61). But, contrary to what the Examiner asserts, this is clear evidence that the foaming reaction is a non-frothing reaction. That is, this foaming relies upon the heat of reaction to expand the blowing agents. Expansion does not occur as the mixture instantaneously leaves the mix head. Rather, it occurs only upon being deposited on the surface or into the mold. The Examiner erroneously equates this language to the condition of foaming instantaneously

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5 Claim 64

upon leaving the mix head[6].

Finally, Appellants maintain there is no requirement that they demonstrate a difference in their invention based on the amounts allowed for by the teachings of Raynor. This is illogical since Raynor expressly requires no substantial expansion. To require Appellants to provide evidence of something that is already evidenced by statements within the prior art reference is redundant and misguided. Raynor seeks to provide a low viscosity non-froth foam that can satisfactorily be used in molding intricate foam articles by means of a portable foaming apparatus. Raynor does not teach adding an inert gas to increase the volume of the developing foam as it instantaneously leaves the mix head. Stated another way, those skilled in the art know that the continued addition of nitrogen to the stream will eventually lead to pre-expansion or frothing. At low levels, Raynor discovered that nitrogen can advantageously serve as a nucleating agent. Thus, even if Applicants were required to demonstrate the teachings of Raynor, logic would dictate that nitrogen should be added to provide sufficient nucleation without pre-expansion. That is, one of skill in the art would stop adding nitrogen at a level where pre-expansion begins to occur. In contradistinction, Appellants claim the addition of nitrogen well beyond pre-expansion; Appellants claim a level of nitrogen that causes at least a 25% volume increase or pre-expansion.

Turning to inherency, it is well settled that inherency requires that the relevant missing descriptive matter (here, frothing) be necessarily present and would be so recognized by one of skill in the art. *In re Robertson*, 169 F.3d 743, 745, 49 USPQ2d 1949, 1950-51 (Fed. Cir. 1999); *see also* M.P.E.P. 2112. Inherency cannot be established by possibilities. (Id., M.P.E.P 2112). Contrary to these legal requirements, the Examiner relies on possibilities:

> "...though it is maintained that applicants' claim limitation mentioned above only pertains to amounts of gas employed, it is noted that though Raynor et al. desires no substantial pre-expansion (column 5 lines 50-65), it does not fully exclude some pre-expansion and through its language "no substantial pre-expansion", and further, the disclosure of Raynor et al. indicates that "the foaming reaction commences practically

6 Appellants' written description addresses this distinction at page 12, noting that non-frothing occurs one or two seconds after the ingredients leave the mix head, which would be about the time the foaming reaches the surface of the laminator.

> as soon as the mixture is deposited" which encompasses the conditions defined by the claims." (Page 4, Final Office Action, 11/30/2010)

The Examiner's continued assertion that Raynor inherently teaches the expansion as claimed is in error because the claims distinguish between the expansion of an inert gas for the foaming process versus the expansion of the blowing agent or foaming agent due to the heat of reaction of the chemical reaction that takes place.

Regardless of the actual physical amounts of nucleating gas employed by Raynor as described in Col. 4, lines 15-32, the nucleating gas cannot be deemed to necessarily be effective in increasing the volume of developing foam as it instantaneously leaves the mix head prior to the time any blowing agent that relies on the heat of reaction to expand can contribute to the foaming process under atmospheric pressure by at least 1.25. There is simply no evidence that the amount of nucleating agent taught by Raynor would cause the increase in volume of developing foam as it instantaneously leaves the mix head. The simply "possibility" that it might is not enough.

The Examiner has not provided a rationale or evidence tending to show inherency. The claims of the present invention are not composition or article claims that mirror the composition or article of the prior art and merely fail to provide the recited function of the claims. Rather, they are method claims providing an entirely different method of manufacturing a *polyisocyanurate* foam or foam insulation board than is provided by the method in Raynor.

While there has been clear error in the rejection under 35 U.S.C. § 112, first paragraph, as set forth above, Appellants note that the Final Office Action indicates that rejections under 35 U.S.C. § 103 "will need to be reinstated and/or reconsidered for reinstatement when the new matter is removed from the claims."

Applicants maintain that it is appropriate to note that the claimed invention is likewise not obvious in view of Raynor. Raynor teaches a non-froth polyurethane foam. This clearly teaches away from the claimed invention. One of ordinary skill in the art would

not even recognize, let alone be motivated, to consider the possibility of frothing.

In light of these arguments, a Decision indicating that claims 1, 30, 31, 34-36, 46, and 51-54 are not anticipated by Raynor is earnestly solicited.

Arguments against anticipation of Claims 34 and 51 by U.S. Patent No. 5,264,464 to Wishneski et al.

The Examiner has rejected claims 34 and 51 under 35 U.S.C. 102(b) as being anticipated by Wishneski (U.S. Patent No. 5,264,464).

Wishneski provides for the use of monochlorodifluoromethane "as the *sole* blowing/frothing agent." (emphasis added, Col. 2, lines 3-4). Wishneski, like Raynor, contemplates the use of nitrogen as a nucleating gas, which cannot — inherently or otherwise — achieve the result of increasing the volume of the developing foam as it instantaneously leaves the mix head, under atmospheric conditions, by at least 1.25. Frothing by use of a nucleating gas is not inherent in this system, and there is no evidence that Wishneski uses an effective amount of nitrogen to increase the volume of the developing foam. In fact, Wishneski states as much, at Col. 7, lines 37-41, noting that his invention seeks to "avoid" the generation of frothed foam by any "auxiliary foaming agent," including the nucleating gas.

There is ample evidence provided within Wishneski that evidences that one of ordinary skill in the art, having knowledge of Wishneski, would recognize that Wishneski seeks to avoid a frothed foam by any method other than by use of one particular foaming agent. That is, to the extent that Wishneski uses a frothing agent to create a frothed foam, any frothing that occurs is imparted by monochlorodifluoromethane (or possibly, water (See Col. 5, lines 52-64)), not any nucleating gases. See Col. 1, lines 53-57 and Col. 2, lines 2-3. Thus, Wishneski does not and cannot provide an inert gas (*e.g.*, nitrogen) that, when added to one or both of the streams of reactants, increases the volume of developing foam as it instantaneously leaves the mix head, prior to the time any blowing agent that relies on a heat of reaction to expand can contribute to any foaming process, under atmospheric

conditions by at least 1.25.

Next, regardless of the actual physical amounts of nucleating gas employed by Wishneski, the nucleating gas cannot be deemed to necessarily be effective in increasing the volume of developing foam as it instantaneously leaves the mix head prior to the time any blowing agent that relies on the heat of reaction to expand can contribute to the foaming process under atmospheric pressure by at least 1.25. Once again, there is simply no evidence that makes it clear to one of ordinary skill in the art that the amount of nucleating gas in Wishneski would cause the increase in volume of developing foam as it instantaneously leaves the mix head. The Examiner has presented no extrinsic evidence that establishes that the missing matter, i.e., an effective amount of gas to increase the volume of developing foam as it instantaneously leaves the mix head, would be present in the nucleating gas of Wishneski To counter this, the Examiner simply asserts that the burden is on Applicants to demonstrate differences evident in the processes based upon the compositional make-up and/or processing features of their claimed invention. However, as noted above, requiring Applicants to demonstrate these differences makes no sense in that Wishneski has already indicated the exact opposite of what the Examiner asserts to be inherent.

In light of these arguments, a Decision indicating that claims 34 and 51 are not anticipated by Wishneski is earnestly solicited.

VIII. CLAIMS APPENDIX

An appendix containing a copy of the claims involved in the appeal is attached as Appendix A.

IX. EVIDENCE APPENDIX

An appendix containing a copy of the Declaration of Dr. John B. Letts, together with Exhibits A-C, submitted to the Patent Office on March 7, 2006 is attached as Appendix B.

X. RELATED PROCEEDINGS APPENDIX

Not applicable.

The Commissioner is specifically authorized to charge Deposit Account No. 06-0925 in the amount of $540.00 for the payment of fees associated with this Appeal Brief. In the event that an additional fee is due or that any amount should be credited, the Commissioner is authorized to charge any additions fees or credit any overpayment to Deposit Account No. 06-0925.

Respectfully submitted,

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